



ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICES OF COMMUNITIES REGARDING BURULI ULCER INFECTION IN PARTS OF IMO STATE, NIGERIA

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AUTHORS' CONTRIBUTIONS

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ABSTRACT

Knowledge, attitude and practices of communities regarding buruli ulcer infection in parts of Imo State, Nigeria were investigated in this study. A cross-sectional design involving interview with Household Heads in twenty villages and six focus group discussions were applied in 2018. Systematic sampling technique was adopted and a semi structured interviewer-administered questionnaire (validated and reliable) was the key instrument for data collection. The residents were physically examined for buruli ulcer disease and relationships with knowledge, attitude and practices were sought. The result of the reliability test showed that the instrument for data collection was highly reliable. In the study, respondents of age 56-65 years (14.0%) were more likely to think that buruli ulcer is not a health problem; instead it was as a consequence of the gods bewitching a person. Respondents with tertiary education qualification 124 (10.33%) were likely to regard buruli ulcer as a health-related challenge. Respondents who were traders 592 (49.33%) had the highest level of awareness. It was revealed that 96.67% knew about buruli ulcer, 5.83% of them knew it through the media and 9.35% knew it through Hospital Community Members. A total of 480 respondents (40%) attributed the disease to witchcraft, 10.83% perceived it was through insect bites and 23.75% believed it occurs due to lack of hygiene. Indigenous assessment showed that the disease has local names (out-ore; acha-ere) which reflect patterns of resistance and deterioration associated with the disease. Much negative behaviour about buruli ulcer was identified in the communities during the assessment. The findings of the study further showed that many individuals had knowledge about the disease but did not know how to manage the disease, particularly, their attitudes, practices and the way to manage the wound. The study also revealed that the women had difficulties accessing healthcare and therefore, the pains associated with wound management especially during routine-dressing was a serious challenge in the communities as patients were reluctant to visit hospitals for proper management due to overwhelming pains. The attitude and practice culminated in poor clinical management of the disease and invariably was responsible for the high prevalence rate of buruli ulcer in parts of Imo State, Nigeria. Community survey revealed that not much people knew about the mode of transmission and this deficiency limited adoption of preventive measures in the localities. Our study confirmed that buruli ulcer usually affects poor people in remote rural areas with limited access to health care. Our study also confirmed that most ulcers occur on the extremities; lesions on the

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lower extremities are almost twice as common as those on the upper extremities. Based on the outcome of this study, there should be capacity building and infrastructural facilities for handling of buruli ulcer emergency cases in Imo State, Nigeria. Quality health care facilities should be upgraded to adequately cope with buruli ulcer. Vigorous buruli ulcer sensitisation and awareness in communities, its implications, manifestations, signs and symptoms throughout Imo State, should be conducted. There is a need for more research to be carried out as mode of transmission of buruli ulcer diseases is still unknown. Buruli ulcer cases should be referred to qualified physicians to prevent wound severe infections and deterioration. There should be health education towards the misconceptions about the disease in the communities. Concerned authorities should be used in the treatment of buruli ulcer to avoid drug resistance by the wound-infecting microorganisms.

Keywords: Health problem; resistance; lesions; lower extremities; buruli ulcer diseases.

1. INTRODUCTION

Buruli ulcer is a neglected, necrotizing skin disease caused by *Mycobacterium ulcerans* and as part of the consequence, the disease has the capacity to incapacitate the victims and leave them with psychological trauma [1-2]. Painless nodule or swollen locus is part of the early signs of the infection. With time, the nodule can advance to cancer. With advancing deterioration, bone can be implicated and as a matter of fact, buruli ulcer most frequently affects the legs, arms; however fever is rare [3]. According to Dobos *et al.* [4], *M. ulcerans* produces a diffusible lipid toxin, mycolactone, which adversely affects the immune system and culminates in tissue death, and essential for bacterial virulence [4]. Prevention of the disease is difficult because the mode of transmission has not been adequately understood. Bacillus Calmette-Guerin vaccination appears to provide a limited protection. Water sources have been implicated in the spread of this disease. Reports as at 2018 indicate that effective vaccines are not yet available to prevent transmission. However, high profile antibiotics are effective in 80% of the cases and in pregnant women, careful combinations and alternatives are suggested for safety [4]. Amputation of the ulcer to stop further deterioration has been reported in literature [4]. Buruli ulcer has been documented in over 33 countries with tropical, subtropical and temperate climates worldwide, although most of the cases occur in West Africa. Adults and children appear not to be equally infected; however there are discrepancies in different countries and this may depend on habits and human activities [5]. The disease also occurs in animals; however, there is no evidence of zoonotic transmission of the disease. Buruli ulcer is incontrovertibly a neglected tropical disease with its major impact in rural communities of Central and West Africa [6]. Buruli ulcer is probably the third most common mycobacterium disease in immune-competent humans after tuberculosis and leprosy and this case in point is supported by literature [7]. This neglected disease occurs in scattered foci around the world with higher concentration of the disease in West Africa and

Nigeria is also a victim- where facilities for diagnosis and management are poorly developed. Some patients develop osteomyelitis and joint lesions. Notably, natural evolution may lead to spontaneous healing of the disease, but early diagnosis and treatment with high-performance antibiotics have proved very effective [1,8,9]. Surgery remains important for treatment of buruli ulcer disease and in the early stages of infection, surgery is curative and economical. This is because it entails a simple excision followed by an immediate closure. Global opinion maintains that there are no adequate and reliable data on actual burden, prevalence and mode of transmission of the disease [10]. Buruli ulcer does not usually come with notice in many countries and it is often prevalent in localities with limited access to healthcare and dilapidated environmental conditions [11]. Prevalence data are required for appropriate resource allocation and to plan control strategies; usually, traditional healers were the first source of treatment [12]. The disease is unique because it produces a toxin-mycolactone which destroys tissue. The introduction of a combination of antibiotics in 2004 has greatly improved treatment outcomes for those who report early; late diagnosis can result in long and costly hospitalizations with significant morbidity and disability. It can cause serious swelling lesions which may permanently result to deformities. The lesion is a necrotic skin ulcer with deeply undermined edges and parts of the body can be affected. The ulcers slowly progress and usually, this explains why people suffering it often delay seeking early medical assistance. Histological specimen shows large clumps of extra cellular organisms surrounded by areas of necrosis and poor or no inflammatory response. Subcutaneous fat is particularly affected, but underlying bone may also become involved in advanced cases. Therefore, it is necessary to ensure good public health surveillance to monitor its epidemiology and proffer solutions. Undoubtedly, buruli ulcer is an emerging neglected tropical disease that has recently been reported in some countries and as the predominant foci of *M. ulcerans* infections, the disease has been reported in several sub-Saharan African countries including Congo, Uganda, Gabon,

Nigeria, and Ghana. The Ugandan Buruli Group coined the name buruli ulcer because the cases they described were first detected in Buruli County near Lake Kyoga. Since 1980, dramatic increases in the incidence of Buruli ulcer have been reported from the West African countries of Benin, Cote d’Ivoire and Ghana. New foci were also discovered recently in Togo and Angola. The present study is aimed at assessing knowledge, attitude and practices of communities regarding buruli ulcer infection in parts of Imo State, Nigeria.

2. MATERIALS AND METHODS

2.1 The study Area

The study was carried out in parts of Imo State, Nigeria (Fig. 1). Imo State was created out of the then Eastern Central states in July 1976. It lies between latitude 7°45’ and 6°15’ North and Longitude 80 and 89 East. It is bordered on the North and North East by Anambra and Enugu respectively and on the East by Abia State. Its Southern border is shared with Rivers State, while its Western border is shared with Delta State. Out of the twenty-seven Local Government Areas of Imo State, some L.G.A.s and communities were studied. The L.G.A.s studied were Ohaji/Egbema, Oguta, Ikeduru, Isiala-Mbano, Oru-East, Onuimo and Oru -West. The communities in

Oguta sampled were Orsu -Obodo, Agwaa, Egwe Egbuoma and Eziorsu. In Ohaji/Egbema were Abacheke, Mmahu, Egbema. In Oru-West, Ohakpu was studied. In Ikeduru L.G.A., the communities were Attah, Uzoagba, Umuri, Amattah and Amaimo. In Onuimo, Okwe and Aro Ofe Iyi were studied. In Isiala-Mbano, Amuzarii, Umunkwo and Ogbor-Ugiri were sampled. In Oru-East L.G.A., the communities studied for buruli ulcers were Omuma, Nnempi, and Eziamma.

2.2 Study, Design and Sample

A cross-sectional design involving interview with Household Heads in twenty villages and six focus group discussions from June 6 to August 25, 2018 was applied after informed consent of community participants was achieved. The sample size was simply taken as 10% of the number of households in the randomly selected Local Government Areas and these yielded 328 households. Our study applied the systematic sampling technique. Briefly, a list of the villages and the number of households in each village were made. The entire households were assigned a unique identification number. The sampling interval (t) was determined by dividing the total number of households in all picked villages with the number of households to be interviewed. The first household

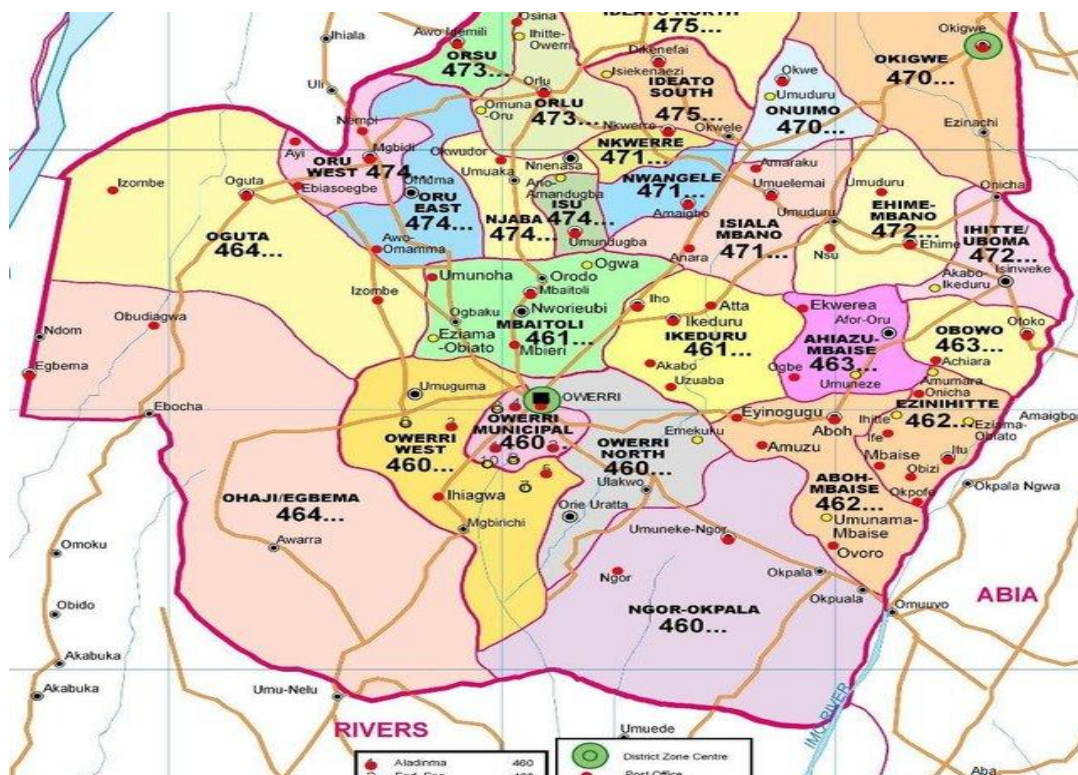


Fig. 1. Map of Imo State showing selected Local Government Areas studied

surveyed was randomly selected by choosing a number between 1 and t using a table of random number, after the first household was identified, the rest of the households were selected by adding the sampling interval to the first randomly selected number. Our Enumerators administered the questionnaire. Data were collected by two teams of four, and each team was managed by a Supervisor. The villagers were informed about the research and its importance in informing the State Health Policy. In support, the Village Heads informed the target villagers some days ahead of the data collection day. Heads of selected households or guardians were told that participation in the study was voluntary, and all were free to say no at any level and data would be aggregated and treated with strict confidentiality. Adult villagers consented on behalf of the children.

2.3 The survey Instrument

A semi structured interviewer-administered questionnaire was used for all participants for the data at village level. It had four sections, namely, demographics of household members (age, gender, educational attainment and denomination); community understanding of the disease; treatment-seeking behaviour; community perception and attitude towards buruli ulcer disease victims. The questionnaire was field-tested prior to data collection for cultural appropriateness and clarity and it was administered in English Language.

2.4 Validation of the Instrument for Data Collection and Reliability Test

The questionnaire was vetted for validation by the Research Supervisor and another Academic Staff in the Department of Sociology of Alvan Ikoku Federal College of Education, Owerri, Nigeria. After validation, the instrument was tested in some Local Government Areas that were not part of the selected Local Government Areas and these included Mbaitoli Local Government Area and Ehime Mbano Local Government Area. The aim was to ascertain the reliability of the instrument in answering the research questions.

2.5 Focus Group Discussions

A total of five focus group discussions (comprising of male and female adults and youths) were deployed. Each focus group discussions comprised 4-8 people depending on availability of the participants. The focus group discussions guide was developed from the structured questionnaire. Question that required in-depth information in order to understand the aetiology and treat-seeking behaviour of

Mycobacterium ulcerans infection were included in the guide.

2.6 Assessment and Physical Examination of the Study Population

A total of one thousand two hundred people were assembled and physically examined at the Health Centres in the selected Local Government Areas of Imo State, Nigeria for the presence of the various stages of the clinical manifestations of the buruli ulcer disease ranging from nodule, oedema, plaque and ulcerative lesions and this was achieved with active support and assistance from the German Leprosy and Tuberculosis Relief Association in co-operation with National Tuberculosis and Leprosy Control Programme. This was achieved in accordance with the recommendation of Ethical Committee of Imo State University, Owerri, Nigeria. The period of assessment was August 2015 to June 2019. Chronological questions were asked such as, how did it start? Was it painless? Do you know buruli ulcer is not caused by witchcraft? Have you gone to hospital? Are you aware that buruli ulcer is not a punishment? In line with Amofah *et al.*, [13], the Local Government Areas chosen for this study were due to the predisposed environmental risk factors associated with buruli ulcer that are prone to the spread of the disease. Adverse cases encountered during the study were referred to Federal Medical Centre Owerri Imo State, Nigeria in the capital city of Owerri and surgeons from there, occasionally visit the Health Centres to conduct surgical operations.

2.7 Statistical Analysis

Data obtained in the study were analysed using simple percentages and frequency table. The results of data analysis were summarised in the result tables.

3. RESULTS AND DISCUSSION

The result of the reliability test showed that the instrument for data collection was very reliable. Table 1 shows result with respect to demographic characteristics and gave more insight about awareness on buruli ulcer diseases and its causes. Respondents of age 56-65 years (14.00%) were more likely to think that buruli ulcer is not a health problem; instead it was as a consequence of the gods bewitching someone. Respondents with tertiary education 124 (10.33%) were likely to regard buruli ulcer as a health related challenge. Respondents who were traders 592 (49.33%) had the highest level of awareness. Table 2 summarizes the extent of knowledge of buruli ulcer disease in the study area. Of surveyed population, 96.67% knew about buruli ulcer while 3.33% never

knew about the disease. Precisely, 5.83% of them knew it through the media whereas, 9.33% knew it through the Hospital. Table 3 presents details of community perception of the disease while Table 4 shows community attitude to the disease, perceived causes and prevention. Briefly, from Table 3, it was observed that a total of 480 respondents (40%) perceived the disease to be due to witchcraft, 10.83%

believed it was through insect bites and 23.75% believed it occurs due to lack of hygiene. Interactions with the respondents showed that the disease has a local name. Briefly, in Oguta Orsu Titi, the disease is called otu-ore whereas in Ikeduru the local name is acha-ere. The names imply un-healing wound and the people regarded buruli ulcer as a health problem.

Table 1. Demographic status of participants in the research in Imo State, Nigeria

| Characteristics | Frequency (N = 1200) | Percentage (%) |
|---------------------------|-----------------------------|-----------------------|
| Gender Group | | |
| Male | 628 | 52.30 |
| Female | 572 | 47.67 |
| Age Group | | |
| 15-25 | 32 | 2.67 |
| 26-35 | 240 | 20.00 |
| 36-45 | 440 | 36.66 |
| 46-55 | 248 | 20.67 |
| 56-65 | 168 | 14.00 |
| 66- Above | 72 | 6.00 |
| Educational Status | | |
| No education | 506 | 42.16 |
| Primary school | 200 | 16.67 |
| Secondary/High school | 308 | 25.67 |
| Technical | 62 | 5.17 |
| Tertiary | 124 | 10.33 |
| Religion | | |
| Christianity | 1080 | 90.00 |
| Islam | 20 | 1.67 |
| Traditionalist | 80 | 6.66 |
| Others | 20 | 1.67 |
| Occupation | | |
| Trade | 592 | 49.33 |
| Farming | 268 | 22.33 |
| Fishing | 118 | 9.83 |
| Civil Servant | 82 | 6.83 |
| Sand Quarry | 48 | 4.00 |
| Unemployed | 56 | 4.67 |
| Others | 36 | 3.00 |
| Marital Status | | |
| | Frequency | Percentage (%) |
| Single | 496 | 41.33 |
| Married | 204 | 17.00 |
| Divorced | 100 | 8.33 |
| Widowed | 400 | 33.33 |

Table 2. Knowledge of buruli ulcer in some Local Government Areas of Imo State, Nigeria

| Characteristics | Frequency (N = 1200) | Percentage (%) |
|--|-----------------------------|-----------------------|
| Knowledge of buruli ulcer (Blister, plagues) | | |
| No | 40 | 3.33 |
| Knowledge of buruli ulcer (Blister, plagues) | | |
| Yes | 1160 | 96.67 |
| Media | 70 | 5.83 |
| Hospital | 112 | 9.33 |
| Community members | 732 | 61.00 |
| Victims | 210 | 17.50 |
| Rumors | 36 | 3.00 |

Table 3. Community perception towards buruli ulcer in some parts of Imo State, Nigeria

| | Frequency (N = 1200) | Percentage (%) |
|--------------------|----------------------|----------------|
| Bewitched | 480 | 40.00 |
| Lack of hygiene | 285 | 23.75 |
| Sustained wounds | 186 | 15.50 |
| Insects bites | 130 | 10.83 |
| Normal sick person | 119 | 9.92 |

Table 4. Community attitude in some parts of Imo State, Nigeria on buruli ulcer, causes and prevention

| Characteristics | Frequency (N = 1200) | Percentage (%) |
|---------------------------------|----------------------|----------------|
| Causes | | |
| Natural | 420 | 35.00 |
| Supernatural | 680 | 56.67 |
| Both | 100 | 8.33 |
| Prevention | | |
| Clean environment | 386 | 32.17 |
| Good hygiene | 500 | 41.66 |
| Not bathing in the river | 100 | 8.33 |
| Sand quarry | 50 | 4.17 |
| Bcg vaccination | 72 | 6.00 |
| Not falling out with bad people | 50 | 4.17 |
| Talisman | 42 | 3.50 |



Plate 1. A plaque stage victim from Onuimo L.G.A. Imo State, Nigeria

Location: Right arm, 2015. Source: Authors' life photography

The study discusses the assessment and behaviour of buruli ulcer patients and ascertains if buruli ulcer patients have the same treatment and management strategies which tally with the current WHO research agenda on the disease [2,14]. Results showed much negative behaviour to buruli ulcer disease. The findings of the study further revealed that many people had knowledge about the disease but did not know how to handle the disease, particularly, the attitude, practice and the way to handle the wound. This is similar to the reports in literature [7]. Community assessment revealed that the women had

difficulties accessing healthcare. The pains associated with wound-management especially during routine-dressing were a huge challenge as patients were reluctant to visit hospitals for proper management due to overwhelming pains. This development culminated in poor clinical management of the disease and invariably gave rise to the high prevalence rate in parts of Imo State, Nigeria. This is supported by literature [14]. Disease awareness and clear knowledge of the mode of transmission would serve as an advantage for preventive measures. Unfortunately, few people in the sampled population

were not aware of buruli ulcer disease and mode of transmission is not known. These deficiencies limit preventative measures. This assertion agrees with the reports of Clancey *et al.* [6], Noeske *et al.* [11] and WHO [2].

Focal outbreaks precisely follow flooding, human migrations and man-made topographic modifications such as dams and resorts [9, 15] and these associations account for the variations in cases observed in the different Local Government Areas. Generally, deforestation and increased agricultural activities might have significantly contributed to the

recent marked increases in incidences of *M. ulcerans* infections, especially in West Africa (to which Imo State is part), where the disease is rapidly emerging [16]. Buruli ulcer commonly affects poor people in remote rural areas with limited access to health care. Our study confirmed this information. The present study revealed different clinical manifestations of buruli ulcer disease in the communities sampled and also confirmed that most ulcers occur on the extremities; lesions on the lower extremities are almost twice as common as those on the upper extremities (Plates 1 to 7).



Plate 2. The ulcer stage victim from Amaimo Ikeduru L.G.A., Imo State, Nigeria
Location: Left leg, 2016. Source: Authors' life photography



Plate 3. The ulcer stage victim from Umuri Amaimo Ikeduru L.G.A., Imo State, Nigeria
Location: Right leg, 2016. Source: Authors' life photography



Plate 4. Ulcerative stage victim from Oru-East L.G.A., Imo State, Nigeria
Location: Left leg, 2016. Source: Authors' life photography



Plate 5. Ulcerative stage victim from Ohaji/Egbema L.G.A., Imo State, Nigeria
Location: Right leg thigh, 2017. Source: Authors' life photography



Plate 6. Ulcerative stage victim from Amauzari Isiala-Mbano L.G.A., Imo State, Nigeria
Location: Right ankle, 2016. Source: Authors' life photography



Plate 7a. Ulcerative stage victim from Amauzari Isiala-Mbano L.G.A. Imo State, Nigeria
Location: Left sheen leg, 2016. Source: Authors' life photography



Plate 7b. Ulcerative stage victim from Amauzari Isiala-Mbano L.G.A. Imo State, Nigeria
Location: Left sheen leg, 2016. Source: Authors' life photography

4. CONCLUSION AND RECOMMENDATIONS

Knowledge, attitude and practices of communities regarding buruli ulcer infection in parts of Imo State, Nigeria were investigated with clear findings. Indigenous assessment showed that the buruli ulcer has different local names which reflect patterns of resistance and deterioration associated with the disease. Much negative behaviour about buruli ulcer was identified in the communities. The study revealed that many individuals had knowledge about buruli ulcer but did not know how to manage the disease and associated problems effectively. Community survey

revealed that majority of the people did not know about the mode of transmission of the disease. The study confirmed that buruli ulcer usually affected poor people in remote rural areas with limited access to health care. The study also confirmed that most ulcers occurred on the extremities; lesions on the lower extremities were almost twice as common as those on the upper extremities. Based on the outcome of this study, the following recommendations were made. There should be capacity building and infrastructural facilities for handling of buruli ulcer emergency cases in Imo State, Nigeria. Quality health care facilities should be upgraded to adequately cope with buruli ulcer. Vigorous buruli ulcer sensitisation and

awareness in communities, its implications, manifestations, signs and symptoms throughout Imo State, should be conducted. There is a need for more research to be carried in order to uncover the mode of transmission of the disease. Buruli ulcer cases should be referred to qualified physicians to prevent wound severe infections and deterioration. There should be health education towards the misconceptions about the disease in the communities. Concerned authorities should be used in the treatment of buruli ulcer to avoid drug resistance by the wound-infecting microorganisms.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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